Benson

Polytechnic High School

Bronson Kim, Chris Halverson, Devon Straub, Theo Nguyen & Rose Adrian

Innovate Challenge

2014

PSU Maseeh College of Engineering

Table of contents:

Thursday, April 3rd 2014. 3:30pm-4:30pm

Points:

- Complete medical Omni tool
- Convenience
- Freedom from doctors (visits)
- Ease of access
- Integrated electronically
- Automated
- Hub
- Customizable
- Elders in mind for design
- Anyone can use
- Design!!!!
- The google of health care
- Philosophy for the elderly
- Modular
- Wireless
- Remote bracelet
- Familiar
- Turn old items into new tech
- Simplicity of form, not function
- Ports
- Extractable data
- Automated response
- Noiseless mode
- Reputation for extreme reliability
- Durability

Idea: have utensils and daily used items that do similar things to the medical devises… Wireless fork that measures blood sugar, toothbrush that takes your temperature, scale that takes vitals, watch that as user ID and can do other things, etc. With hidden away control tower, items are plug and play type. Stethoscope and other medical equipment also wirelessly recorded. USB ports on box, blue tooth dongle style and sized, box sends records out to the doctor!

Agenda: (And other important things)

Things:

1) Page – Get on the same one!
    - Write words or phrases we feel are important to the Medibox.
2) Organization
    - Poster
    - Presentation
    - Power point
    - Prototype
3) Spend last week or two practicing presenting!

Next Meeting:

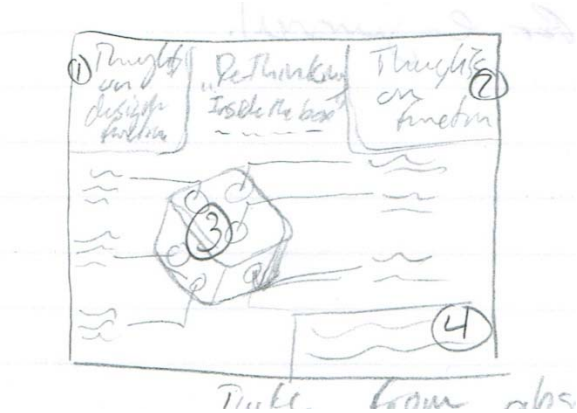
Thursday, April 10th

Meet Online too!

Thursday April 10rd 2014, 3:30pm-5:00pm

Agenda:

1) Poster Design
   - Create working title and basic layout



Utensils:
Fork-----Blood Sugar/Diabetes
Toothbrush –Saliva
Watch---Blood Pressure/ Pulse

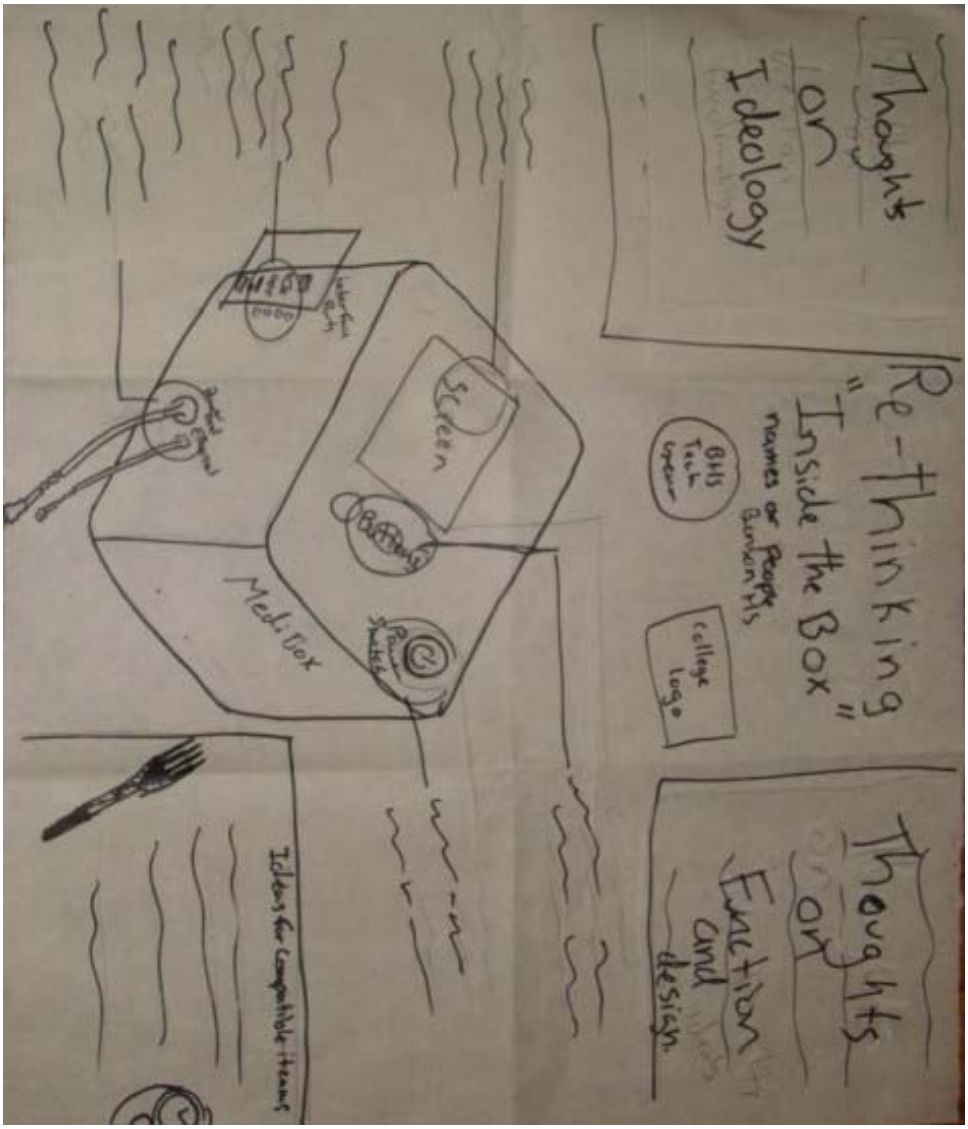
1) Take some of the text from the abstract and add some additional information, as well as change the concept to the new one.
2)
3) Pull a lot from the abstract then expand on the ideals illustrated there. (Universal Capture and Analyzing Router?)
4)
5) Make a digital model of the Medibox, maybe just a 3D cube of the rectangular box. Add in extra details and outline them with the pointing part!
6)
7) Use this space to incorporate the different possible devices that would be compatible, and their functions.

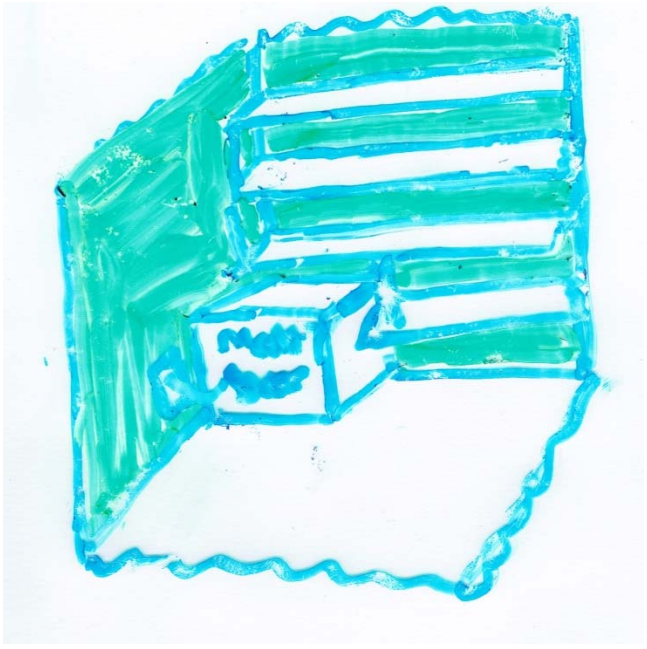
Use the example poster to pull the PSU logo off and use it as a template for sizing.

Pick target colors:

- Medibox: black or white
- Background: light blue or opposite to medibox
- Text: contrasting to BG.
- Outline boxes: text or contrast to BG.

Poster Design Layout:





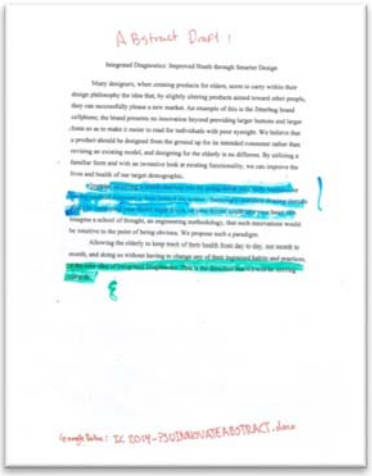
Friday, April 11rd 2014. 12:30pm-3:30pm

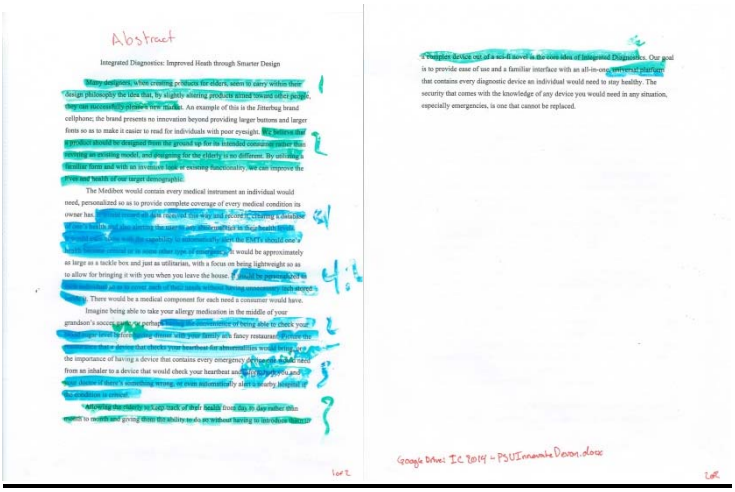
Those who were in attendance today: Rose Adrian and Bronson Kim.

Rose continued work on the poster while I was jotting down whatever came to mind in a section that I will refer to as *Bronson's Musings*. (I believe that this section can only be a worthwhile pursuit.) She began with the written portions one and two by drawing her content from the two abstracts written. She'll be filling in more at a later point.

When she was scanning through the abstracts she highlighted sections of them with blue and green highlighters with the former indicating line that pertained to the design and function while the latter representing ideals of function. The Poster and notebook have next Friday as their deadline and as such we will compile all of our work into a single file on the Thursday prior leaving the day of for finalization.

Next Meeting: Wednesday.





Innovation Challenge Mentors' Meeting – April 3, 2014

- Friday, April 18, 2014 – DEADLINE
  - Project team poster submission
  - Blog/journal submission (e-format)

- Maseeh College visits
  - Tuesday, April 22, 4-6pm (Franklin)
  - Wednesday, April 23, 4-6pm (Alliance, MLC)

- Project presentation and judging (FINAL EVENT)- Saturday, May 3, 2014
  University Pointe, Room 102

  DRAFT PROGRAM

  - 8:30-9:15 - teams check in and register
  - 9:15am - welcome remarks
  - 9:30-11:30am - 4 schools will give presentations (10 minutes for presentations + 10 minutes for Q&A + set up)
  - 11:30am-1pm - lunch for teams in EB Atrium
  - 1-3:00pm - 4 more school teams give presentations
  - 3-3:30pm – break
  - 3:30-4:30pm - top 2 college teams present their projects to high school teams and audience
  - 4:30pm - awards ceremony

- Next mentors' meetings Disregard this info:
  - Thursday, April 17 at 4:30pm, EB84
  - Thursday, May 1 at 4:30pm, EB84 (last meeting before final event!)

Wednesday, April 16th 2014. 3:30pm-4:30pm

Agenda:

Write out ideas to fill in content on the poster, and work on e-journal… Bronson is working on his BroMusings, Theo is writing about the ideology. Chris is gathering ideas on the physical design of the box itself for making a CAD image for the poster. Devon is writing more on the physical designs and ideology. Rose is working on e-journal and more details on the poster.

Things to do before Friday:

- Posting writings in Google Drive.
- Finish Poster
- Draft (CAD) MediBox
- Type up journal entries
- Create e-journal

Next Meeting:

Tuesday April 17th

Mentors May come tomorrow!!!

We decided the 23rd is a better day then the 22nd to go to the PSU workshops we have an early release that day so we are more available.

April 16th 2014
Brain Barfs from Team Members:

Chris Halverson:

Computer Aided Drafting, or CAD, is pretty darn handy when you need to visualize something. I've taken about a year and a half's worth of CAD teaching, and so I'm getting drafted to do, well, the drafting. Unfortunately, my Medibox concept art/3D model won't be ready in time for the notebook turn-in date. However, what I lack in speed, I make up for in quality. I intend to have a full 3D model of the Medibox by the time of the presentation, and if I can use a 3D printer, we will actually have small-scale models of the Medibox, and perhaps even more. This means that we'll have some cool things to pass around during the presentation, and I'll be accredited with being useful and providing an in-demand skill to the Benson PSU Innovate Challenge Team^{tm}.

Theo Nguyen:

I have been thinking about product design. The ideas behind product design are simple enough, a product must fill a need, it must distinctly appeal to its target consumer a product must be wanted. However these ideas somehow get muted when designing products for the elderly. Looking at these products we asked ourselves, "was there a need for this product to be changed like this?" and often times the answer is "no." A product to the elderly doesn't have to promise to improve their lives by adding something new to their routine. The elderly have developed their methods and routines and don't need something new to worry about. A product to the elderly should enhance their lives without burdening or inconveniencing them; a product for the elderly should enhance their life without asking them to change anything.

Devon Straub:

It's designed to be easy to use for the elderly and requires very little maintenance; it should be as autonomous as possible. With autonomous updates, diagnostics like clockwork. It would have automatic protocols that alert doctors upon warning signs in the patient's health.

Thursday April 17th 2014, 3:30pm-5:30pm

Agenda:

- Read over poster text
- Additions? Substitutions?
- Work on e-journal
- April 3rd collage visit _ Time?
- Care home site visit?

Chris: will still be working on the CAD design, changed from poster to presentation/3D printed.

Bronson: work on BroMusings for e-journal

Devon (late): will work on typing up e-journal

Theo: at dentist's appointment

Rose: revising poster text, working on e-journal/paper journal + task manager.

All members (present) agreed with poster text, mentors arrived of 4 pm. Team filled in Vlad (mentor) in on the idea change (he had been busy with classes the last few weeks) then discussed college visit and site visit:

April 23rd, Wednesday @ 2pm site visit to care home

April 23rd, Wednesday @ 4 pm – 6pm college event day starts @ PSU

Poster and e-journal due tomorrow (Friday, April 18th) @ 4pm (email to Mashall!)

Documents

Integrated Diagnostics: Improved Heath through Smarter Design

Many designers, when creating products for elders, seem to carry within their design philosophy the idea that, by slightly altering products aimed toward other people, they can successfully please a new market. An example of this is the Jitterbug brand cellphone; the brand presents no innovation beyond providing larger buttons and larger fonts so as to make it easier to read for individuals with poor eyesight. We believe that a product should be designed from the ground up for its intended consumer rather than revising an existing model, and designing for the elderly is no different. By utilizing a familiar form and with an inventive look at existing functionality, we can improve the lives and health of our target demographic.

Imagine receiving a health checkup just by going about your daily business, or having medical diagnostics done behind the scenes. Seemingly mundane dinning utensils could be measuring your blood sugar levels, or your mirror could take your heart rate. Imagine a school of thought, an engineering methodology, that such innovations would be intuitive to the point of being obvious. We propose such a paradigm.

Allowing the elderly to keep track of their health from day to day, not month to month, and doing so without having to change any of their ingrained habits and practices, is the core idea of Integrated Diagnostics. This is the direction that we will be striving towards.

Integrated Diagnostics: Improved Heath through Smarter Design

Many designers, when creating products for elders, seem to carry within their design philosophy the idea that, by slightly altering products aimed toward other people, they can successfully please a new market. An example of this is the Jitterbug brand cellphone; the brand presents no innovation beyond providing larger buttons and larger fonts so as to make it easier to read for individuals with poor eyesight. We believe that a product should be designed from the ground up for its intended consumer rather than revising an existing model, and designing for the elderly is no different. By utilizing a familiar form and with an inventive look at existing functionality, we can improve the lives and health of our target demographic.

The Medibox would contain every medical instrument an individual would need, personalized so as to provide complete coverage of every medical condition its owner has. It would record all data received this way and record it, creating a database of one's health and also alerting the user to any abnormalities in their health levels. It would even come with the capability to automatically alert the EMTs should one's health become critical or in some other type of emergency. It would be approximately as large as a tackle box and just as utilitarian, with a focus on being lightweight so as to allow for bringing it with you when you leave the house. It would be personalized to each individual so as to cover each of their needs without having unnecessary tech stored inside it. There would be a medical component for each need a consumer would have.

Imagine being able to take your allergy medication in the middle of your grandson's soccer game, or perhaps having the convenience of being able to check your blood sugar level before having dinner with your family at a fancy restaurant. Picture the reassurance that a device that checks your heartbeat for abnormalities would bring, or the importance of having a device that contains every emergency device one would need from an inhaler to a device that would check your heartbeat and inform both you and your doctor if there's something wrong,

or even automatically alert a nearby hospital if the condition is critical.

Allowing the elderly to keep track of their health from day to day rather than month to month and giving them the ability to do so without having to introduce them to a complex device out of a sci-fi novel is the core idea of Integrated Diagnostics. Our goal is to provide ease of use and a familiar interface with an all-in-one, universal platform that contains every diagnostic device an individual would need to stay healthy. The security that comes with the knowledge of any device you would need in any situation, especially emergencies, is one that cannot be replaced.

4/10/14
2 of 2

Bronson's Musings (April 11, 2014):

So what do we have right now? The MediBox ("Medibox?" "Medi Box?") has evolved away from the whole all-in-one portable diagnostics tool into something more along the lines of a network of items to be sold at a venue such as Ikea (Old people love Ikea).

The MediBox Server, which is to say the actual box itself, should be something that a consumer can purchase (or be prescribed by their doctor) once and then leave running in their crawlspace or under the kitchen sink and never concern themselves with again.

Along with the Box it's self there would be a collection of accessories that would be the actual diagnostics equipment. They would be things like a watch that uses infrared tech to measure heart rate, a fork that reads you blood sugar, a pillow that analyzes sleeping patterns. All of this data would be sent to the box to be gathered and configured.

From there the options are

a) Have the data sent to your doctor remotely
    - Pros: Elderly people don't have to touch the tech, data can be sent instantly for a real-time play-by-play
    - Cons: Can potentially get hacked O.O
b) Bring a data chip (flash drive/SD card/something else) from the box on your next appointment
    - Pros: Virtually unhackable, easier to make
    - Cons: Elderly have to remember the card, doctor only gets the data at check-ups

Bronson's Musings 2 (April 14, 2014):

Alright! I had this idea for a new accessory (I need to think of a better word to use here) to equip the Medibox with. In case what I am referring to is not clear, by accessory I mean the toothbrush that takes blood sugar, the pillow that monitors sleep patterns, and the wrist-watch that watches your pulse.

The big idea? Shoe insoles! I love this because it is something that lot's of old people have, they would keep on them all throughout the day, and there are a ton of options and uses that they could potentially monitor. It could focus on anything from weight to exercise to monitoring the stride length and pace so anomalies in the way they walk could be used to deduce subtle ailments that could go otherwise unnoticed.

Bronson's Musings 3 (April 16, 2014):

Another accessory idea! Dentures! This is one that could contain a lot of tech inside and easily be covered for under dental health care. I really want to make as much of this stuff something that the average middle-class elderly person could afford without having to break the bank. The more of this that could be covered by insurance agencies, the better. On an unrelated note Theo coined the term "BroMusings" today and I think I'm going to roll with it from now on.

BroMusings 4 (April 17, 2014):

So we need to schedule when we'll visiting a care facility. It looks like we'll have to wait on that decision until the mentors get here to decide on that particular point. The plan is to go to said facility and pitch our idea to the target demographic, thereby having the ideal feedback on our plans as well as, in the event that they like it, credibility in our concept. Contrawise (got to love Lewis Carroll) if the feedback yielded turns out to be negative we will still have gained, something likely even more valuable, a proverbial wake-up slap in the face that we need to get our butt's in gear and take a massive shift in our plans to see what we can salvage.

Rose says we're going to PSU on the 23rd of April due to the early release that we have scheduled for that day.

Something I forgot to mention: THE MEDIBOX TECH WILL BE NON-PROPRIETARY.

Quick list of Accessories thus far:

- Pillow
- Dentures
- Wrist-watch
- Toothbrush/Fork
- Glasses
- Shoe Insoles

Note to self: We are not necessarily be bound by the technology of this day and age. Also it is entirely possible (read reasonably likely) that we may actually get to implement our MediBox in real life. Now that I know it is possible, I suddenly really want this to be made into a reality.

We can have the MediBox be standard equipment for care facilities.

Innovate Poster Text (long version):

Thoughts on function:

Imagine receiving a health checkup just by going about your daily business, or having medical diagnostics done behind the scenes. Seemingly mundane dinning utensils could be measuring your blood sugar levels, or your watch could take your heart rate. Having the convenience of being able to check your blood sugar level while having dinner with your family, the reassurance that a device that checks your heartbeat for abnormalities would bring, informing both you and your doctor if there's something wrong, or even automatically alert a nearby hospital if the condition is critical. It would record all data received this way and record it, creating a database of one's health and also alerting the user to any abnormalities in their health levels. It would even come with the capability to automatically alert the EMTs should one's health become critical or in some other type of emergency. The Medibox should be something that a consumer can purchase (or be prescribed by their doctor) once and then leave running in their crawlspace or under the kitchen sink and never concern him or herself with again. The box would come with one or more wristbands (or watches) that have a programmable user ID in it. When worn by the programed user, the band will tell the Medibox which individual's file to record data to, incase there are multiple users in a household with a Medibox. Along with the Medibox there would be a collection of accessories that would be the actual diagnostics equipment such as: items would be something similar to; a watch that uses infrared tech to measure heart rate, a fork that reads blood sugar, and/ or a pillow that analyzes sleeping patterns. The line of network compatible items could be sold at a venue that sells basic medical equipment alongside other consumer goods, like a pharmacy store. All of this data would be sent to remotely and analyzed at the Medibox, and either sent wirelessly to the individual's doctor, or stored in the Medibox till the patience's next appointment.

Compatible Items:

We would want to make as much of these items things that the average middle-class elderly person could afford without having to break the bank and the more of these that could be covered by insurance agencies, the better.

Dentures are a great example of an item that could contain a lot of tech inside and easily be covered for under dental health care. Shoe insoles are something that a larger number of old people have, they would keep on them throughout the day, and there are a ton of options and uses that they could potentially monitor; anything from weight or exercise or stride length and pace so anomalies in the way they walk could be used to deduce subtle ailments that could go otherwise unnoticed. A toothbrush that takes your temperature, a fork that reads you blood sugar, a pillow that monitors sleep patterns, and the wristwatch could use infrared tech to measure heart rate.

Thoughts on design concepts:

The ideas behind product design are simple enough, a product must fill s need, it must distinctly appeal to its target consumer a product must be wanted. However these ideas somehow get muted when designing products for the elderly. Many designers, when creating products for elders, seem to carry within their design philosophy the idea that, by slightly altering products aimed toward other people, they can successfully please a new market. Looking at these products we asked ourselves, "was there a need for this product to be changed like this?" and often times the answer is "no." A product to the elderly doesn't have to promise to improve their lives by adding something new to their routine. The elderly have developed their methods and routines and don't need something new to worry about. A product to the elderly should enhance their lives without burdening or inconveniencing them; a product for the elderly should enhance their life without asking them to change anything. By utilizing a familiar form and with an inventive look at existing functionality, we can improve the lives and health of our target demographic. Allowing the elderly to keep track of their health from day to day, rather than just a doctor visit every month. Giving them the ability to do so without having to introduce them to a complex device out of a sci-fi novel is the core idea of Integrated Diagnostics. This is the direction that we are striving towards.

Extra Point on poster!

All of the data would be sent to the box to be gathered and configured.

From there we came up with some options:

a) Have the data sent to your doctor remotely
   - Pros: Elderly people don't have to touch the tech, data can be sent instantly for a real-time play-by-play
   - Cons: Can potentially be hacked if proper encryptions are not in place.

b) Bring a data chip (flash drive/SD card/something else) from the box on your next appointment
   - Pros: Virtually impossible to hack, easier to make.
   - Cons: Elderly may have trouble remembering the card, and the doctor only gets the data at check-ups.

An individual could consult with their doctor to decide which method would be better for their needs.